

Research in Planetary Astronomy

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Strategy

This program has focused on the study via near infrared observations of the outer planets and their satellites. In the last year these observations have emphasized imaging observations using the Cassegrain infrared camera at the f/70 focus of the 200 inch Hale telescope.

Progress and Accomplishments

Images have been obtained in the 2.0-2.4 μm atmospheric view of Saturn, Uranus, and Jupiter. This is a unique window on the outer planets, because the strong methane and molecular hydrogen absorptions allow us to detect features in the stratosphere of the planets.

From 2.0-2.4 μm Saturn shows a bright band between 25 and 50 degrees north latitude, while the planetary disk disappears completely at the 2.3 μm in the depth of the methane band. The bright band must be due to aerosols in the atmosphere of Saturn above the 300 mbar pressure level.

Uranus remains bland and featureless in the near infrared images. Neptune showed a previously unobserved haze and a feature prominent in the Voyager visible light images. Neptune's northern hemisphere showed a thin haze that is present even in the 2.3 μm images. This haze must be at a very high altitude because of the strong methane absorption. A bright feature, believed to be a companion to the "Great Dark Spot," appears in occasional images in the southern hemisphere of Neptune.

In addition to the planetary disk images, we believe that we have recovered the newly discovered Neptune satellite 1989 N1 in K band images. The object is quite faint, K~19 mag.